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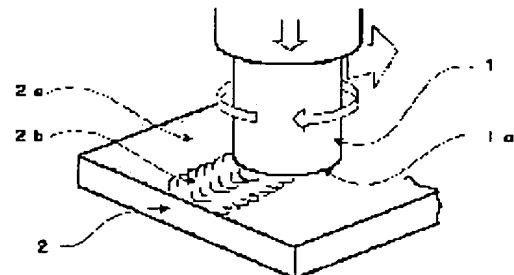
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(54) METHOD FOR MODIFYING SURFACE OF METALLIC MATERIAL

(57)Abstract:

PROBLEM TO BE SOLVED: To improve the mechanical properties and heat resistance of metallic material, while a rod having the m.p. and strength higher than those of a metallic material is rotated, and the surface part of the metallic material is pressurized, by moving it, heating the surface part of the metallic material to the temp. in which it is freely plastic-deformed, executing stirring and microfabricating the structure of the surface part after cooling.

SOLUTION: A metallic material 2 is placed and fixed to the surface of a table of a machine tool, and a rod 1 composed of the material having the m.p. and hardness higher than those of the metallic material 2 is clamped to the main shaft of the machine tool. By this constitution, when the rod 1 is rotated, and, while the surface part 2a of the metallic material 2 is pressurized by the surface part 1a, the table 2 is moved, the surface part 2a of the metallic material 2 is heated to a temp. in which it is freely plastic-deformed and is moreover stirred. In the surface part 2a, after cooling, its structure is refined, and a modified part 2b is formed. At this time, the contact time between the rod 1 and the surface part 2a is controlled to about 0.8 to 1.7 sec, and the surface part 2a is not melted, so that there is no fear of involving gas in the air therein to obtain a uniform and fine structure free from circular openings after the cooling.



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